RHEUMATOID ARTHRITIS.

September, 1927. Harold Heyworth Holden.

M. D. 16th Dec. 1927.

The Ministry of Health in No.23 of its "Reports on Public Health and Medical Subjects" published in 1924 states that nearly one-sixth of the industrial invalidity of this country is due to diseases classed as "rheumatic". Each year these diseases are costing the Approved Societies nearly £2,000,000 in sick benefit and the nation over 3,000,000 weeks of work from the insured populations alone. Half this loss, both of money and of time, is due to chronic joint disease.

One of the most common troubles which flesh is heir to is grouped under the term "rheumatics". This name has in its time played so many parts, and so many varied interpretations have been placed upon it that its correct place in modern medicine is difficult to be sure about. A retro--spect of the progress made in the requisition of our knowledge of rheumatic diseases will make us alive to the difficulties, and also show us the debt we owe to many investigators whose names are inseparably linked with our advance in knowledge.

"Reumes"

By both ancient and mediaeval physicians the word was used in accordance with its etymological sense/

sense, "reumes" being used to denote all those diseases which were attributed by them to the defluxion of an acrid humour upon some one part or other of the body. The writings of Hippocrates (460-370 B.C.), Celsus (who lived in the reign of Tiberias Caesar), Galen (131-201) and Alexander of Tralles (525-605 A.D.), who first recommended col--chricum in gout, contain good descriptions of gout and diseases due to "reumes". The source of these peccant humours they assumed to be located in the brain, which organ their fanciful pathology had invested with all the functions and capabilities of an absorbent and secreting gland. The growth of knowledge showed the brain as the central organ of the nervous system, and gradually the grotesque con--ception of its glandular nature was ousted by the humoralistic doctrine.

"Humoral Pathology"

This regarded health and disease as the proper adjustment or imbalance respectively of the qualities hot, cold, moist, dry, with the four humors of the body, blood, phlegm, yellow bile, and black bile. Under this doctrine the word "rheum" gradually became restricted in its usage to affections of the mucous surface, while at the same time the term "reumes" came to indicate a constitutional morbid state characterized/

characterized by a medley of distempers reputed to originate from the circulation within the system of acrid humour. During the Middle Ages this doctrine gradually fell into disrepute, and the term "reumes" came to be a synonym for defluxions, humours and catarrhs of all sorts.

"Rheumatism"

Guillaume de Ballion (Ballonius, 1538-1616) introduced the term "rheumatism", dissociated it from its primitive interpretation, differentiated it from acute gout and restricted its usage to the particular group of symptoms we now call "acute articular rheumatism". In 1683 Thomas Sydenham (1624-89) published his "Tractatus de podagra et hydrope" in which he materially clari--fied the clinical confusion, indicating even yet more clearly the essential differences between gout and rheumatism. A still greater advance in differential diagnosis was made by William Cullen (1712-90). In his "Synopsis nosologiae methodicae" (1769) he discriminated acute from chronic artic--ular rheumatism, and the articular types from simple muscular rheumatism. He attributed the genesis of all forms of rheumatism to "chill" - an idea still flourishing in the public mind.

It was not until the year 1800 that the con--dition we now recognize as rheumatoid arthritis was/

was differentiated from gout.

In this year Landre Beauvais read a thesis on "Goutte Asthenique Primitive" in which he called attention to the special liability of women to asthenic gout, to the chronic course which the disease runs; to the destruction of the articular cartilages which it causes and to the enlargement and deformity of the patients' joints, which he showed could not be due to deposits such as are met with in gout.

William Heberden (1710-1801) described the nodules in the fingers which occur in rheumatoid arthritis in 1802.

In 1805 Haygarth, a Bath physician, publish--ed his clinical "History of Diseases", giving the clinical appearance of rheumatoid arthritis, describing it fully, and differentiating between it and rheumatism - "there is one painful and troublesome disease of the joints, of a peculiar nature, and clearly distinguishable from all others by symptoms manifestly different from the gout and from both acute and chronic rheumatism".

In 1833 Brodie in his work on "Diseases of the Joints" calls attention to the disease as quite distinct from both rheumatism and gout. During the years 1829 to 1840 Cruvielhier wrote pointing out the necessity of observing its clinical/

clinical characteristics, and gave it the name of "Usure des cartilages articulaire". He is sure that true bony ankylosis may occur.

Robert Adams (1791-1875) one of the founders of the Dublin School of Medicine published a work which he entitled "Chronic Rheumatic Arthritis". This work added very considerably to our know--ledge of the morbid anatomy of the disease. He agreed with Cruvielhier that the disease began in the synovial tissue and that it was inflammatory in nature. He also noted the severity with which the muscles are assailed, pointing out the severity of the spasmodic contractions, and the intense atrophy not only of the muscles themselves but also of their tendons which he showed in some cases underwent even total absorption.

In 1852, Fuller, in his work on "Rheumatism and Allied Disorders" calls it "Rheumatic Gout". He says that although it is in some respects closely allied to rheumatism yet he considers it more of the nature of gout: at the same time he thinks it is a distinct disease.

In 1853 Charcot and Frastow published their thesis. They gave the disease the name "Rheu--matisme Chronique Primitif" and held that it was only a form of chronic rheumatism.

Sir Alfred Garrod showed conclusively that the excess of uric acid in the blood, so typical of/

of gout, is absent in this disease, and in 1890 he wrote a treatise on the malady to which he definitely applied the term "Rheumatoid Arthritis"

The work of cleavage between the various man--ifestations of rheumatism was achieved tardily, but progress was being made. Physicians forsook speculation and vain imaginings as to the cause of disease and now endeavoured to localize dis--orders - to link them with definite structural changes in organ and tissue. There was an im--provement too in diagnostic methods, and gradually the territory allotted to rheumatism shrank within reasonable limits. With the dawn of the nineteenth century, the great group "rheumatoid arthritis" was withdrawn from the category of "rheumatic" diseases, and shortly afterwards the so-called "Charcot's" joints were definitely assigned a neurotrophic origin .

The discovery of Charcot's seemed to lend colour to the idea that the articular changes in rheumatoid arthritis were secondary to, and dependent upon some disorder of the nervous system and led to the neural theory of its origin. Ramak in 1858 put forward this idea, and in 1876 this conception was revived by Spender who, describing the condition under the term suggested by Virchow, i.e. arthritis deformans, considered that its symmetrical mode of onset and progress were most easily/

easily accounted for by some disturbance of the central nervous system. This view was ably advo--cated later on by Sir Dyce Duckworth, Ord. (Br. Med. Jour. 1884) and Spender (Osteoarthritis 1889) The lesions in the nervous system are so scanty and inconsistent, that the neural view is not now regarded as an explanation of the varied phenomena of the disease.

"It is one of the lessons of the history of science that each age steps on the shoulders of the ages which have gone before" (Sir Michael Foster). The researches of bacteriologists threw a flood of light upon varieties of arthritis, which under the term "rheumatism", had wrongfully included many varieties which we now know to be due to specific infections. In 1881, Charles Jacques Bouchard (1837-1915) formally proclaimed the essential distinctions from acute rheumatism, of these types of arthritis, and we are now familiar with a surprising array of infective arth--ritides gonococcal, syphilitic, influenzal, pneu--mococcal, typhoidal, tuberculous.

In regard to rheumatoid arthritis, this idea of microbic infection marked the commencement of a new era. Enthusiastic search was made by various workers and at times announcements have been made that micro-organisms have been discovered in the synovial fluid of the diseased joints, but it/

it is probable that as the secrets of the workings of the disease are understood fully, this is not to be regarded as essential. "There may be no actual infection of the joints with organ--isms but the lesions may result from the toxins of organisms, the latter remaining at a distant and possibly not always recognisable site. (Luff, 1912).

In January, 1912, the "Practitioner" issued a special number devoted to "Rheumatism" and from an article by Arthur P. Luff in that number, I take this description as a guide to the idea prevailing before the war. "Rheumatoid Arthritis is a constitutional disease, not a local one - the affection of the joints is only a part, although an important part, of the morbid process. It is I believe, a disease due to the presence of organisms which gain access to the blood, in the majority of cases probably through some chronic catarrh of the alimentary tract, although the invasion may occur from the mouth, nose, pharynx, or air tubes. After gaining access to the circulation, they find a suitable nidus for their growth in the joints, where they grow and pro--pagate in the synovial membranes, ligaments, cartilages and bones. As a result of their presence, inflammatory changes occur, which result in ulceration, erosion, destruction, and coincidently, as a rule, in hyperthrophy also."

At the discussion on rheumatoid arthritis at the British Medical Association meeting at Bath in 1925, the concensus of opinion was that the primary origin of the disease was infection.

It is probable that along with infective processes, other factors are at work in producing the complete picture of the disease, but the points are still in dispute, and various theories will be dealt with as opportunity arises inthe following pages.

Etiology.

Relative Frequency.

Report No. 23 of Ministry of Health on "The Incidence of Rheumatic Disease" contains the following table showing the relative frequency of the Nine Rheumatic Diseases of the adopted classification.

over/

Classification.		Total No. of cases of each disease.		Percentage of all Rheumatic cases.		No. of cases for 1000 insured persons.	
	Group.	M.	F.	M.	F.	M.	F.
A	1. Acute Rheumatism.	51	58	2.9	7.0	0.88	1.76
A	2. Subacute "	169	114	9.5	15.4	2.91	3.47
A	3. Muscular "	363	235	20.5	31.8	6.26	7.14
B	4. Lumbago "	584	95	33.0	12.9	10.07	2.89
B	5. Sciatica & Brachial Neuritis	172	46	9.7	6.2	2.97	1.40
C	6. Rheumatoid Arthritis	83	97	4.7	13.1	1.43	2.95
C	7. Osteo "	149	71	8.4	9.6	2.57	2.16
C	8. Gout	150	3	8.5	0.4	2.59	0.09
C	9. Unclassified Joint Changes	50	20	2.8	2.7	0.86	0.61

For the group of Chronic Joint Changes (C) the report states, it is necessary to re--member the bias of the female insured population on the youthful side. In actual numbers the males have nearly as many cases of rheumatoid arthritis (83) as the females (97), and the apparent attack rates for all ages of the sample population are 1.4 per 1000 for the males, compared with 2.95 per 1000 for the females. If however we examine the attack rates in the separate age groups we find the female attack rates is twice the male, in the 16-24 group/

group, six times in the 25-34 group, two and a half times in the 35-44 group, twice in the 45-54 group, five times in the 55-64 group, and nearly eight times as great as the male in the last group. Thus - - -

Attack rates per 1000 in each Age Group.
Insured Persons.

Age Groups		16-24	25-34	35-44	45-54	55-64	65
Rheumatoid Arthritis.	M.	.33	.34	1.06	3.43	3.75	6.47
	F.	.67	1.91	2.73	7.60	18.24	49.43
Osteo "	M.	.13	.34	1.71	2.32	9.5	35.20
	F.	.07	.56	1.47	7.60	16.72	60.84
Gout	M.	0	.13	1.38	6.08	9.56	17.96
	F.	0	0	0	1.14	0	0

The findings of this inquiry thus fully bears out Strangeway's statement (Cambridge 1907) that more than three women suffer from rheumatoid arthritis to every male patient. For in every 1000 insured males of all ages, there was one case of rheumatoid arthritis, while in every 1000 insured females there were three cases of rheumatoid arthritis.

Predisposing Causes.

Attacks of influenza, empyema, furinculosis, or almost any inflammation of bacterial origin are known to precipitate arthritis and rheumatism; and/

and any conditions which tend to reduce the general well-being of the individual, are at least a contributary, if not in themselves the direct cause.

Recent studies of arthritis and rheumatism in the American Army during the World War demonstrate that exposure of various kinds was the immediate cause in 60 per cent. of the cases. This corroborates the old popular idea that cold and wet are aggravating factors. (Cecil: Text Book of Medicine 1926). Whether the well recognised influence of the intestinal tract upon these disorders depends upon its relation to metabolism or upon the infections which it may harbour is not yet definitely known.

The action of the endocrine is also questioned. "Arthritis and endocrine disorders are both commonly due to the same cause - namely infection. There is strong evidence that diabetes is, in its early stages caused in a large percentage of cases by a chronic toxaemia, such as obtains in rheumatoid arthritis, and I have seen several early cases of exophthalmic goitre, in which focal infect--ion was an obvious causal factor. For these reasons it seems clear that arthritis and endocrine disorders, when co-existent, are both due to a common cause - namely infection

infection" (Wilcox: Practitioner. Aug.1927).

The most fully understood as well as the most emphasised cause in infection. Evidence of the infective nature of rheumatoid arthritis may be summarised as follows:-

(a) The anaemia and disturbance of general health is of a type we have learned to associate with chronic infection.

(b) The occasional acute febrile onset.

(c) Many well known pathological organisms give rise to arthritis and fibrositis, indistinguishable from chronic rheumatism. Gonococcal infection forms one of the best known examples, but others may be cited - as those of bacillary dysentery, pneumococcal infection, and typhoid and paratyphoid fever.

(d) Foci of infection, in which the predominating organism is a non-haemolytic streptococcus, are frequently found when the cases are investigated early. The nose and throat are the most common site of such trouble. Even when the tonsils are buried and apparently small, they may be grossly infected. The teeth come next in order of importance, chiefly in relation to apical diseases and gingivitis. The causative infection may occur in the nasal sinuses, gall bladder, genito-urinary/

urinary tract, or any other part of the body."

"The rule of focal sepsis in the production of joint disease is not clearly known, but an explanation is suggested by the phenomena of allergy.

Allergy is defined as a state of hyper-sensitiveness to a foreign material. When the specific material, to which the patient is sensitive, is brought into contact with the body in one way or another, an allergic reaction occurs: the characteristic feature of the condition is that normal people show no reaction whatever in similar circumstances. Bacteria are among the very numerous substances to which a patient may be sensitive. The allergic reaction may be either local or general. Hay fever is a good example of the local reaction. Serum sickness is an instance of the general reaction. The tuber--culin reaction is an example of an allergic reaction in a patient sensitive to bacteria or their products.

Bacterial allergy differs from the type of allergy with which we are most familiar, but in that reaction occurs more slowly, and subsides more slowly. Moreover the reaction differs in type, having the character of an inflammatory reaction. The hypothesis is suggested that rheumatoid arthritis is a result of a long succession of allergic reactions occurring in joints sensitised to streptococci. (Stone)

(Stone. Practitioner. Sept. 1927)

The connection of some degree of Protein Sensitivity in gout, it is interesting to note, has been suggested by Thomson and Gordon of Bath in their Chronic Rheumatic Diseases". They note "Gout is frequently associated clinically with spasmodic asthma, hay fever, and eczema, of which the first two are always, the last very frequently due to abnormal sensitivity to certain proteins. The idea that gout may, at any rate, in certain cases, be due to the same cause, is borne out by the frequency with which it is found that certain particular articles of diet may precipitate an acute attack".

Another reference to this in connection with Acute Rheumatism occurs in Cecil's Text Book of Medicine, 1926, viz. - "The heterogeneity of the streptococci recovered, has forced certain observers to consider rheumatic fever to be a peculiar mode of response on the part of the patient to a number of different types of stimuli rather than the effect of a uniform stimulus or causative agent. Some even consider it a phenomenon of hyper-sensitiveness of the type encountered in serum disease."

If this view of bacterial allergy be accepted as a working hypothesis in the treatment of rheumatoid arthritis, then the obvious indications are, to use in the first place very small doses of vaccine, and through-

throughout course of treatment, to avoid producing reactions in the joints; the object being, not to make the patient's blood bactericidal to streptococci, but to keep the "antibody" content of the blood at such a level that streptococci no longer produce re--actions in the joints. This agrees with the treatment adopted in the pages following.

PATHOLOGY.

The first objective evidence of the pre--sence of rheumatoid arthritis is found in the synovial membrane of the affected joints. The membrane is swollen, hyperaemic, and con--gested, its connecting tissue is proliferating and greatly increased in amount. This thickening of synovial membrane and periarticular tissue is the main cause of enlargement of joint. Effusion in these joints is variable. At this stage there are no bony changes, and the cartilages are still intact. No changes are seen in the joints on X-ray examination at this stage, and Goldthwait of Boston, U.S.A. describes this form of the disease as the Infective.

The inflammatory process spreads more or less gradually to all the fibrous tissues, in and/

and around the joint, and then secondary changes take place, and involve both cartilage and bone. The synovial membrane becomes much less vascular and more fibrous, its folds adhere to each other, and fat tends to be desposited in it, reaching in old cases to the extent of large fibro fatty masses. The capsule and periarticular tissue become thickened and hardened, and contract, the tendons become adherent to the neighbouring parts and the whole fibrous tissue structure of the joints lose their softness and elasticity, and take on a hard, sclerosed, unyielding feel. The cartilages roughen and gradually become worn away and thinner over their whole extent. Degeneration and atrophy from pressure and disuse appear to cause these changes, and finally the under-lying bone is laid bare, connective tissue and blood vessels grow up from the bone marrow, or in from the sides, and the bony sur--faces, if in apposition, unite by fibrous ankyl--osis. Bony ankylosis may ultimately develop. (Stockmann).

This is the atrophic stage of Goldthwait and X-rays show the cartilage atrophied and the shafts of the bones rarified. Nichols and Richardson, also American observers, classify this change as Proliferative Arthritis, generally characterised by swelling of the

soft/

soft tissues, especially in the smaller joints and by ultimate subluxation or ankylosis.

Stockmann says that "In his studies, Goldthwait has relied very largely on the result of Rontgen ray findings, but Bradford and others state that they have found it very difficult to classify cases sharply into atrophic and hypertrophic by skiagraphy. He urges from the clinical standpoint that the nature, diagnosis, and treatment of such a complex disease as rheumatoid arthritis cannot be satisfactorily settled by the simple process of taking an X-ray plate of the joints. At the best, it is only a small help."

It is probable that many cases of arthritis are infections of a mixed type, and terminal results of the morbid processes are thus apt to be puzzling unless we bear this in mind.

Following on, or coincident with, the changes in joints, there may be extensive secondary changes. Muscular atrophy is common and may appear with great rapidity. Subluxation may occur, especially in the knee and finger joints. The hands often show great deformity, particularly ulnar deflection. Contractures may follow and the joints become fixed in a flexed position. Neuritis and trophic disturb--ances may be associated. (Osler)

The Committee appointed to investigate "The Incidence of Rheumatic Diseases" classified them into three main groups:-

A. Acute Rheumatism, together with sub-acute rheumatism.

B. Non-articular manifestations of so called "rheumatism". (Muscular rheumatism, fibrositis, etc.)

C. Diseases characterised by joint changes.

These three main groups were then sub-divided into nine categories or "diseases", e.g:-

A. Acute and sub-acute Rheumatism.

B. Muscular Rheumatism, Lumbago, Sciatica, Brachial Neuritis.

C. Rheumatoid Arthritis, Osteoarthritis, Gout, and unclassifiable joint change disease.

Rheumatoid Arthritis was classified amongst the diseases of Chronic Joint Changes as an Infectious Peri-Arthritis and differen--tiated as follows:-

Usually with an acute initial attack of <u>pyrexia</u> of considerable length:

<u>Many smaller joints</u> usually affected, especially 1st and 2nd Phalangeal Joints: spindle-shaped joints.

The Tempero Maxillary joint is often affected: changes mostly <u>peri-articular</u>, often accompanied by much fibrositis: Lesions often bilaterally symmetrical: Nutrition of patients almost invariably bad; patients usually females.

The/

The disease most commonly known as rheumatoid arthritis is a chronic inflammatory affection of the joints characterized by changes of various degrees in the synovial membranes, peri-articular tissues, cartilage and bones, resulting in pain, limitation of movement and deformities. (Tidy: Synopsis of Medicine.)

It is a constitutional disease, not a local one - the affection of the joints is only a part, although an important part of the morbid process. It is believed to be due to the presence of micro-organisms which after gaining access to the circulation find a suitable nidus in the joints and as a result of their presence inflammatory changes are brought about which result in thickening of synovial membranes and peri-articular tissues. At a later stage cartilage and articular sur--faces are destroyed.

It is probable that along with infective processes other factors are at work to produce the complete picture of this disease. "The complete chain of events which shows itself in symptoms of rheumatoid arthritis only materialises under certain circumstances. In that chain a lowered metabolic rate may be a link: the dysfunction of certain endocrine glands may be another link: the germs themselves/

themselves are but one link in the whole process." (H. Warren Crowe: "The Treatment of Chronic Arthritis and Rheumatism.")

Rheumatoid Arthritis usually commences in one joint, commonly one of the metacarpo phalangical articulations. The onset is insidious. There is pain and swelling of the affected joint, at first the swelling is due to peri-articular thickening rather than to effusion. The disease does not flit from joint to joint. Temperature may be raised, but it is as a rule lower than in other acute articular diseases. Joint swellings are persistent and may spread to other joints, in some cases rapidly. Rapid muscular wasting and vasomotor troubles may occur. When the disease has assumed the chronic form signs indicative of destruction of cartilage may become evident. It is most commonly exhibited in females (about 70% of cases) and is especially prone to start about the climacteric period. Any debilitating condition may predispose to the disease and it often follows repeated attacks of influenza. Pain and stiff--ness at the back of the neck is due to affection of the joints of the cervical vertebrae and there is remarkable symmetry in the affection of the smaller joints of the hands.

I/

I will now describe three cases of patients who had suffered for years from rheumatoid arthritis and exhibited all the features of this most distressing malady.

(1) Case of Mrs. Hands.

This patient was 84 years of age in February, 1927. She has been confined to bed for 20 years - since her right knee became ankylosed. The fingers of both hands are flexed into the palms; there is subluxation of the phalangeal joints and complete loss of power: both wrists are ankylosed and there is loss of supination and pronation. Elbows will move through angle of 120°, there is loss of movement at each shoulder. She can just touch her lips with her fingers, cannot feed herself, and couldn't brush a fly from her face. Neck is fixed, left knee can move in angle of 120°, right knee is ankylosed at right angle.

Her history is interesting. At the age of 12 she entered a mixed grocery business where she was employed by her uncle and aunt. Much of her work was in the bakehouse tending the hot ovens for baking bread and cakes. Her hours of work would be from 7 a.m. to 11 p.m. and/

and much later on Saturdays and busy days. During this time she lived on the premises, was treated by her aunt and uncle as "one of their own" - having no wages. She says that she "lived on promises", as her uncle promised to leave her some of his property when he died. Unfortunately her aunt succumbed to the wear and tear of the life at the age of 50, her uncle married again, had a family, and the claims of this patient were forgotten. The situation is piquant enough for one of Arnold Bennett's novels of this district.

She says that before she was 20 she'd "taken a ton of medicine" being very troubled with constipation and flatulence.

She married at the age of 21 and had 8 children, 6 of whom are now alive.

When 46 years of age, she had a very severe illness. Dr. Spanton, a great medical authority of those days in the Potteries whose dogmatic pronouncements one still combats from the vantage ground of modern medicine, was called in and she is emphatic that he spent half an hour in giving her a most careful examination. She says Dr. Spanton told her she had very longstanding disease of the liver and stomach and was "worn out in her inside". He said she couldn't live to the end of that summer. She was ill for six weeks and then

The Hands of Mrs. Hands.

This case is described on Page 7.

began to improve.

It is worthy of note that she is sure that there was no mention of "rheumatism" at that time.

"Rheumatism" began in her right index finger and she used to have "twinges of Rheumatism" when "ill in bed with other things". Rheumatism gradually bothered her more and more and her own doctor prophesied that "rheumatism would go all over her", and that she would live to put flowers on his grave. He suffered from diabetes and both his prophesies were fulfilled. Eventually the right knee became "stiff" and she has been a prisoner in bed for 20 years. A small, worn little body of 84, she is very bright and alert in mind; often racked with pain at night and beguiling the time by singing her Methodist hymns. She lives on liquid food and has two distressing days a week when Fridays and Mondays she has her aperient dose of salts. She is now fast losing her sight with advancing cataract in both eyes.

Seventy years ago this unfortunate patient worked like a slave and her alimentery system began then to get out of proper working order: she married and bore eight children and arrived at the menopause with her system weakened and fell a prey to the arthritis. It cannot further cripple her, and it cannot take her

life.

(2) Case of Mrs. Brown.

This patient was 62 years of age in March 1927. Up to October 1913, she was perfectly free from "rheumatism".

Until 21 years of age she lived at home with her mother, occupied with housework. She was troubled in these years with "indigestion, dyspepsia and constipation", and used to have medicine from the doctor.

She would occasionally be in bed about a week with "pains in chest and stomach" and used to get "run down". She had a lot of pain at her monthly periods, sometimes more severe than others. She menstruated 5 days and was always perfectly regular.

Married at the age of 21 she never had any children or any miscarriages. Her stomach trouble seemed to improve and though she used to get "run down" and in a low state of health she had no serious illness.

In October 1913 her fingers began to swell and were attacked with pain which she describes as "dreadful". The doctor said it was rheumatism and gave her medicine. Constipation was always troubling her. Then her feet became painful and her ankles were swollen. Her doctor now sent her from Stone, where she lived then, to the North Stafford/

Stafford Infirmary, Stoke-on-Trent; a railway journey of 9 miles, which she took 3 times a week. She says she had her feet put in water and electricity passed through the water: this treatment continued from August 1914 to August 1915. In spite of this she got gradually worse; the knees now became swollen and painful, they "fastened her" and she had to stay in bed.

While still able to get painfully about with the help of sticks she went to Buxton for periods of 8 or 9 weeks at a time for four consecutive annual treatments. They gave her baths, cautery to her knees, massage, and medicine - cod liver oil and malt mostly.

She had much pain and was very "run down".

Her husband had died in 1904. Menopause at 50 years of age. The doctors at Buxton had told her that the complaint came on through "shock of the nerves".

Condition gradually got worse and she broke up her home and came here to live with her sister. She has now been confined to bed for 10 years.

Her condition is as follows:-

Left arm and hand completely crippled.
Fingers straight and can't be moved.
Spindle-shaped swellings at 2nd.Phal.Jt.
Wrist completely ankylosed.

Elbow completely ankylosed at Rt.L.
Shoulder Joint ankylosed.

Right arm and hand.
Fingers straight, Spindle-shaped and can't be bent.
Ulnar deviation of 1".

Wrist ankylosed.
Elbow joint partly ankylosed; can just raise a cup to her lips.

Knees completely ankylosed at angle of 120°.
Ankle stiff and swollen.

Head bent forward, movement restricted.
Much pain in neck.
Tempero Mandibular Joints sore and stiff at times.
Pain most severe in head now and not often free from it.

This patient had the advantage, it is of interest to observe, of regular and prolonged treatment at Buxton and yet it failed to arrest the progress of the insidious malady.

(3) Case of Mrs. Walton.

This patient died in April 5, 1927, at the age of 69-10/12 years. She had been confined to bed for the past eight years, the last four of which she had been under my care. During the time I attended her she had pain largely in her knees which were both stiff and ankylosed at angle almost of 90°. The fingers of both hands were swollen, spindle-shaped and couldn't be bent. Her wrists were completely ankylosed and the left wrist was much thickened by a large, hard nodule. Elbows moved slightly and by a great effort shoulder joints would just allow her to touch the top of her head.

She was much troubled by flatulence and water and would drink dilute Hydrochloric acid with/

Mrs. Knight, 96, Albert Street, Newcastle, Staffs.

Aged 53 years.

Shows swelling of metacarpo-phalangeal Joints, especially the 1st. and 2nd. joints, bi-lateral, with ulnar deviation and wrists beginning to be involved.

Began to have pain and swellings of these joints four years ago.

with great gusto as it helped to digest her food at once.

She died of Cerebral Haemorrhage, and I have included her in this list because she was one of the patients whose bedridden condition and pathetic life made one seek for things to do to prevent such a fate befalling any patient entrusted to our care.

The lesson from these three cases is that it is of the greatest importance to be able to recognise the earliest signs of rheumatoid arthritis, as they assume an importance out of all proportion to their apparent severity. S. G. Billington (Br. M.J. June 21, 1924) says "Three stages of rheumatoid arthritis can be recognised:

(1) Early, with slight or recently developed joint lesions:

(2) Active arthritis with definite arthritic changes:

(3) Old standing arthritis, with or without the presence of the active disease, but with post-arthritic deformities, contractures, muscular atony and wasting."

The general practitioner must endeavour to identify the disease when he meets it at stage (1). If there is definite joint lesion there will be <u>pain</u> apart from movement, the night pain being most characteristic: <u>Local tenderness</u>: and <u>general debility</u> with often a toxaemic facial/

facial aspect.

Some writers have given premonitory symptoms which they have found of value in helping their diagnosis and I have been at pains to collect and make use of the following:-

(1) Weakness in the muscles of the forearm and the extrinsic muscles of the hands and fingers. These patients will complain that they drop something they are attempting to lift, suddenly and without warning. "It is this muscular weakness coming on without apparent arthritis or with only the slightest sign or arthritis that is so typical of rheumatoid." (H. Warren Crowe.)

(2) Symptoms of Paraesthesia. Patients complain of sensations in the hands and fingers - tingling, pricking, etc.

(3) Sweating of the palms. "A very definite perspiration and scarlet flush over the hypothenar eminence is absolutely pathognomic of rheumatoid arthritis." (H. Warren Crowe.)

(4) Fingers may be often blue, cold and "dead" - a picture may be that of Raynaud's disease.

(5) Darting pains may be felt.

(6) It is very unusual for one hand alone to be affected.

(7) "The most important symptom of all is that of a subjective fine grating sensation apparently in the joints of the upper cervical vertibrae - Nuchal Crepitus." (H. Warren Crowe.)

(8) It is frequently possible to spot a case of rheumatoid arthritis simply from the complexion. A faintly cyanotic or ashen tinge is almost pathognomic of rheumatoid arthritis. There is a transparent look about some/

some of these people in the early stage of the disease which is distinctly reminiscent of phthisis.
(Crowe.)

(9) "The most marked diagnostic sign is the condition of the muscle itself. In rheumatoid arthritis, it is soft, in chronic rheumatism it is firm and resilient - the diagnosis can be made by shaking hands with the patient - the hand of the patient has a soft, jelly-like feel, and the bones are distinguishable because there is no resilience in the muscles."
(Percy Wilde, Bath.)

(10) "Early diminution of the power to supinate is one of the most striking features of the disease."
(R. Llewellyn Jones)

(11) When rheumatoid arthritis has already attacked the hands, it is probable that it has also attacked the feet, and since muscular weakness is one of the main symptoms, we may expect to find flattening of the arch, loosening of the ligament, and consequently a valgoid position of the ankle joint. "A rapidly developed flat foot is almost pathognomic of rheumatoid arthritis" (Crowe).

(2) Throughout the entire course of the disease, but especially during the early stages, fatigue is the most marked and often the most distressing sympton. (Cecil).

With these points in mind, one treated the following cases and watched them with interest.

Mrs. Jones.

This patient was 58 years of age when she attended on Nov. 28, 1925. She complained of "pins and needles" in left arm from elbow to finger/

Mrs. Ada Brown, 200 Etruria Road, Hanley.

Aged 63 years.

Began to have pain and swelling in hands nearly eight years ago while living at Buxton.

Swellings at metacarpo-carpal and metacarpo-phalangeal joints with sub-laxation of terminal phalanx of Rt. thumb.

finger ends. Two years ago left thumb gave her pain, now it is stiff and slightly swollen. The right thumb is now painful in the fleshy part. She has "terrible backache" and pains in hip at night after she gets warm in bed. She says she had Rheumatic Fever 30 years ago. She has four teeth of her own, the rest are artificial. She "stands" in Hanley and Stafford markets on market days selling pottery and some times when handing dishes about she drops them for no apparent reason.

She was given Parathyroid Gland gr. 1/10 at night, and Tinct. Iodi (French Codex), 4 drops in water t.d.s.p.c.

She reported again on Dec. 29, complaining then of pain in the back, numbness in left hand and arm, shooting pains in right thumb and first finger.

On Jan. 6, 1926, she was reporting herself much better. If kept long in one position, she complains, she felt pins and needles in both arms and hands and they would feel cold and numbed.

On Jan. 16, she only complained of hands feeling easily benumbed and cold and was satis--fied she was much better.

Nurse Mayer.

A "District Nurse" of 32 years of age, who/

who does a good deal of walking from patient to patient exposed to all weathers. She complains of cold hands and feet, with loss of feeling, and stiffness and lately both hands have showed swellings at the metacarpo-phalangeal joints. These swellings became painful when warm in bed at night.

After a day's walking her ankles would be swollen and she had pain in big toe joints.

Six weeks' treatment taking capsules (Keratin coated) of Colloidal Iodine, m.$2\frac{1}{2}$
Salol $2\frac{1}{2}$
seemed to relieve the condition and she has repeated this at intervals of six months. Between these "attacks" she has been very well.

Mrs. Riches.

The wife of a bank manager, with no children and 42 years of age. She came on Jan. 9th, 1925, and complained of pain in left hand at second metacarpo-phalangeal joint. This ached all day long and was stiff and swollen. The hand often felt very cold. She has had "rheumatism" in the right hip for years - the hip "gives way" sometimes and is stiff after exertion.

She took one week's course of Capsules Colloidal Iodine and Salol (as above) then one week of Tablets Thiodin compound (Allyl-Thio-Urea)/

Thio-Urea) t.d.s.p.c. and alternately in this way for six weeks.

She then reported herself better, pain gone, swelling gone, and only a slight feeling of pain at metacarpo-phalangeal joint "after playing the piano". Told to report any recurrence she has not had any occasion to do so.

Mrs. Cartwright.

This patient was 57 years of age when she attended in April 1925. She is very talkative and especially so on the subject of her own health. She said she had "come with her nerves" and feels very concerned because she had "neuritis" three years ago and wants to "take it in time". She has "pins and needles" in both hands and arms. There is "no feeling" in the hands in a morning and she couldn't sew a button on or anything like that until an hour or two has passed. She wakes up at night when warm in bed with sensations of pricking and tinglings in hands and arms. Her feet get sore after walking or when she has been going about all day.

After a course of treatment with Parathyroid Gland Gr. 1/10 at night, and 4 drops Tinct. Iodi (French Codex) t.d.s.p.c. her anxiety about her nerves abated. She comes to see me at intervals but not about her "rheumatism", which does not appear to be bothering her now.

Mrs. Bates. 47 years of age.

This patient complains of pain in both hands, especially in the thumbs. There is no swelling and no stiffness. She complains of cold hands and feet, and says she could not strike a match in the night if you were to give her a sovereign. It is this dead feeling in her fingers that frightens her. She has never had any illness and menstruation is still regular.

Mrs. Leigh. Aged 25 years.

This patient complains of pain on movement at the left tempero-maxillary joint. There is tenderness and some stiffness. This has troubled her for three years and the joint would often crack and give a jolt, when she was eating. The first finger of the right hand sometimes swells and she says that she has split quite a few gloves over it. She can feel "pins and needles" in this finger, and says she can foretell changes of weather by the pain in the finger. Four years ago she had "rheumatism" in her feet and arms. She could not walk much, and could not raise her arms to do her own hair. She used to do a lot of singing, but has given it up owing to the pain it causes in her left tempero-maxillary joint. She did not like to go out to tea because of the cracking noise her jaw made. The teeth of this patient were perfect/

perfect, tonsils were healthy and there was no history of nasal catarrh. She was given capsules of collosol Iodine one t.d.s.p.c. on 22nd July 1927, and on 30th August reported that her jaw movements were free and without pain, that her fingers were much better, and that she felt generally better than for some time past.

Involvement of the tempero-maxillary joint is often mentioned as a prominent sympton of rheumatoid arthritis, and the Ministry of Health Report finds the sympton is 12% of cases, yet this is the only one I have found.

DIAGNOSIS.

The etiological agent in rheumatoid arthritis is as yet undemonstrated and there is no characteristic test. So the diagnosis must rest upon direct consideration of the symptons, signs, and course of the disease, and upon the elimination of other conditions. An early case demands very careful observation and examination. The conditions one must bear in mind in differential diagnosis are the following:-

(1) Acute Rheumatism.

(1) Acute Rheumatism.

The actual onset of rheumatoid arthritis may be very abrupt and violent, or so gradual as to escape detection. In some cases it stimulates the onset of acute rheumatism, while in others there are exacerbations quite comparable to attacks of this acute disease. Usually, however, the onset of rheumatoid arthritis is gradual. The characteristic features of acute rheumatism, which distinguish it from the more active phases of focal arthritis are:-

(a) The tendency to involve the larger joints only, though the ankles, knees, hips, wrists, elbows, and shoulders may all be affected in turn, the smaller joints of the hands and feet are rarely involved.

(b) The joint lesions consist chiefly of acute. synovitis. The shape of the inflamed joints is determined more by the configuration of the distended synovial membrane, and is less inclined to assume the uniform spindle-shaped aspect of the periarticular swelling of rheumatoid arthritis.

(c) The duration of inflammatory changes in each individual joint is relatively short, and by the time the disease has the joints attacked, later, those originally involved may have almost/

almost, or quite recovered. In rheumatoid arthritis the joints originally affected show no abatement of inflammation during the steady advance of the disease from one articulation to another.

(d) The pain in acute rheumatism is more acute.

(e) The constitutional symptoms are more severe. The high temperature, rapid prostration, profound anaemia, profuse sweating, and frequent early development of cardiac murmurs are char--acteristic of rheumatic fever, whereas in rheumatoid arthritis, the temperature is only moderately raised - perhaps not at all - anaemia is less severe and of more gradual onset, and though weakness results from muscular wasting, there is less general prostration than in rheumatic fever.

(f) Acute Rheumatism is a self-limiting disease which usually subsides in a few weeks, and is greatly relieved by salicylates. Rheuma--toid Arthritis is of indefinite duration, and salicylates appear to have no effect in mitigating its severity or limiting its course.

(g) Acute Rheumatism tends to recur from time to time in patients whose joints have entirely recovered in the intervals, and in such cases the heart is likely to show signs of chronic endocarditis, whereas in rheumatoid arthritis the/

the first attack invariably leads to permanent changes in the joints, and there is no special tendency to involve the cardiac valves.

(2) Gout.

This is described as an inflammation of the joints, either acute or chronic, attended by the deposition of sodium urate crystals in or about the affected joints, due to a disturbance of uric acid metabolism. In chronic cases there is often a deposition of sodium urate in the sub--cutaneous tissues, most commonly at the margin of the ear, in nodules of varying size, which are termed tophi. The blood in gout, even between attacks, contains an abnormal amount of uric acid. The output of uric acid in the urine is usually less than normal.

Diagnostic signs of Gout are:-

(1) History of an acute attack.

This usually comes on at night. The patient is awakened by pain in one of the feet. The metatarsophalangeal joint of the big toe is affected in the vast majority of cases, but some times the heel, ankle, or instep are involved. The pain is described as grinding or crushing in nature, or as an intense burning, such as might be caused by thrusting a red-hot iron into the joint./

joint. A joint which is the seat of acute gout is greatly swollen and exquisitely tender. The skin in tense and shiny - maybe of a deep red colour. The distension of the veins is striking.

(2) Presence of Tophi.

These should be carefully searched for in every case of suspected gout, and in every case of polyarticular arthritis. They are most commonly situated on the helix of the ear, near its outer margin, and their size varies from that of a pin-head to that of a pea. They are yellow or white in colour. Under the microscope, the characteristic long needle-shaped crystals of sodium urate can be seen.

(3) The elbows and knees should be carefully inspected for thickening of the olecranon and prepatellar bursae. Chronic inflammation of these structures is said to be very rare in any condition except gouty arthritis.

(4) Soft swellings, one or more centimetres in size in the fingers, the backs of the hands, the dorsal surface of the feet, and elsewhere, may be due to the settling of sodium urate in necrotic tissue. If tophi are not present on the ears, one of these nodules should be aspirated or incised, in order to determine whether the characteristic crystals are present.

(5) Determination of the amount of uric acid in the blood is of considerable value in diagnosis, if nephritis can be excluded. The presence of 5 mgm. or more of uric acid per 100 c.c. of blood and a low non-protein nitrogen content, is strongly suggestive of gout. (Cecil)

Repeated attacks of gout may be followed by chronic gout, in which there is persistent discomfort and disability, without intervals of freedom. The joints, especially those of the hands, are usually deformed and there may be pain, stiffness, and low inflammatory changes of wide-spread distribution. In such cases, the ages, sex, personal habits, and previous history of attacks (especially if limited to the great toe) together with the presence of tophi and the results of uric acid estimation, will hardly fail to indicate a correct diagnosis.

X-ray photos of the hands and feet are regard--ed now as of slight aid in diagnosis of gout, at any rate in early stages. Clear circular areas, with sharp borders in the epiphysis of the bones, were formerly thought characteristic of gout. They are common, however, in other forms of chronic arthritis, and are due to atrophy of the bony tissue. If the clear spaces are large, that is 5 m.m. or more in size, it is held to be indicative of gout.

A/

A study of the urine, when the patient is living on a purin free diet, does not yield conclusive results. In gout, the endogenous output of uric acid is usually low, i.e., 0.3 to 0.4 g.m. daily. Immediately prior to an attack the output is usually lessened, while during the height of an attack, the amount of uric acid excreted is increased. Percentage of purin excreted is less than usual, even when food rich in purin is taken, but this low output may occur in other conditions.

There is no doubt that gout and arthritic disturbances are sometimes mutually confused, and there is an increasing acceptance of the suggest--ion that the two diseases are not entirely separate.

(3) Osteoarthritis.

This was a disease reported in the Ministry of Health's Report on "The Incidence of Rheumatic Diseases" with the following signs and symptons:-

Usually a febrile; gradual onset, often at first confined to one large joint, fewer and larger joints affected, especially knee and hips; grating; lipping "eburnation; osteophytes; lesions often asymmetrical; patient usually well nourished."

Chief among the etiological factors in this type of arthritis are interference with nutrition, strain and trauma. It is a local rather than a general disease: occurs in elderly people and in men more frequently than women.

The classical example of osteoarthritis is the malum coxae senilis of the older writers, who described the condition as a monarticular affection. Pain and stiffness are complained of in one of the hip joints. The failure to improve and increasing stiffness may demand further attention, and on physical examination, it is found, on manipulating the hip, that while flexion and extension are relatively unimpeded, abduction, adduction, and rotation are seriously limited. X-ray examination may disclose the presence of osteophytes, and degenerate changes in the bones. In long standing cases, marked deformity may result from absorption of the head, and shortening of the neck of, the femur, or from obstructive osteophytes.

An extremely common form of osteoarthritis in elderly people, especially of the female sex, occurs in the fingers. These outgrowths from the epiphyseal ends of the phalanges are termed Heberden's nodes. They are unsightly, but except as an indication of a tendency to degener--ative changes in the epiphyseal ends of bones they/

they are of no great clinical significance.

Osteoarthritis may be met with, confined exclusively to the knees, and in certain cases of pain and swelling of the ankle joint, associative with a failure of the longitudinal arch of the foot, X-rays demonstrate the occur--rence of degenerative changes, with compensat--ory proliferation in the astragalus.

The diagnosis of osteoarthritis presents no difficulties if an X-ray photograph is pro--cured disclosing the typical degenerative and proliferative changes. This type of arthritis is the Hypertrophic form described by Goldthwait and the Degenerative form of Nichols and Richard--son.

It is in a class of arthritis of mixed type that difficulties of diagnosis are greater. Patients may have both rheumatoid arthritis and osteoarthritis, one condition being predominant at the moment, but both conditions being clearly discernible. Warren Crowe says, - streptococci will be shown to be the cause of osteoarthritis and also of most forms of non-articular rheu--matism, whereas certain staphylococci are at work in rheumatoid arthritis. Each affected joint should be regarded separately. Rheumatoid arthritis in the joint does not exclude osteo-arthritis in another: nor is it at all unusual for signs of both to be present in the same joint.

In disease of long standing, the colour of the patient is quite a good index to the kind of infection. In a purely streptococcal case, the appearance is that of ordinary health, or there may be some pallor suggesting anaemia: whereas a faintly cyanotic tinge is almost path--ognomonic of rheumatoid arthritis. Frequently history will help - as one joint swells, another goes down; this points to osteoarthritis.

In any joint, a greatly thickened membrane giving an intense and horrible grinding sen--sation under the examining hand, suggests osteoarthritis. Again rheumatoid arthritis rarely makes its first attack on a large joint. X-ray photographs should clinch the diagnosis, for in rheumatoid arthritis, we shall see an apparently normal joint save that the bones are more transparent.

It must have been this type of arthritis that Dr. Leonard Williams was thinking about when he said: "The only thing that one can positively assert with regard to rheumatic diseases seems to be that there is no possi-bility of distinguishing between them clinically". (Middle Age and Old Age) In spite of this remark, we venture to think that the above points are as helpful as they are sometimes necessary.

(4) Climacteric Arthritis.

This type has been carefully described by Thomson and Gordon (Chronic Rheumatic Diseases) and by Cecil (Arthritis of the Meno pause). It is a chronic polyarthritis of obese middle-aged women, occurring at, or just after, the menopause. In a series of 50 cases studied by Cecil and Arthur, the average age was 52½ years, and the knees were the first joint affected in 84% of the cases. Certain other joints may be affected, though less often, more particularly the wrists and metacarpophalangeal joints of the thumbs.

On examining the knees they are found to be uniformly enlarged, due in slight degree to periarticular thickening, but chiefly to synovial inflammation. On passive flexion and extension of the joint, while one hand is pressed firmly over the front of it, soft rubbing crepitus is distinctly felt. The condition then is one of chronic synovitis, but if left untreated it may develop later into osteoarthritic changes of the joint.

It is distinct from rheumatoid arthritis in that it occurs in robust, obese women, affects the knee to the exclusion of other joints, and the rapid wasting of muscle, the atrophic skin, and the contractures of rheu-matoid arthritis are absent.

(5) Gonococcal Arthritis.

This type is often most difficult to differentiate from rheumatoid arthritis, and it is considered, that as a forerunner of any form of arthritis, it makes the outlook very much worse. In advanced cases, in which many joints have become affected, the clinical picture may be so similar, that it is impossible, in the absence of direct evidence of gonococcal infection, to decide which type the case belongs to.

It is always secondary to a gonorrhoeal attack elsewhere, and the arthritis is due to the presence of the gonococcus in the joints. It usually appears at the decline of the urethritis, or even when this appears to be cured. It rarely develops before the third week, and its advent may be postponed for several months after the onset of the gonorrhoea. Time is required for the gonococci to reach the glandular tissues of the prostate, whence they are enabled to enter the circulation.

This form of arthritis is in the majority of cases polyarticular. The small joints are usually not attacked so often, and after an onset with polyarthritis, the majority of the affected joints usually clear, leaving one joint/

joint particularly involved. It tends to affect especially the knees, wrists, and sternoclavicular joints.

Fibrositic changes in the tendon sheaths and fasciae are often severe. There may be very extensive swelling in the back of the wrist from effusion into the sheaths of the extensor tendons, and acute inflammation of the plantar fasciae and tissues round the heel may lead to permanent rigidity and severe lameness after all acute inflammation in the joints has disappeared. Inflammation of the sterno-clavicular joint, or painful heels due to a calcaneal spur are strongly suggestive of gonococcal arthritis. The diagnosis is made easy if gonorrhoeal discharge is present. In doubtful cases, the history should be taken into account, and a few small doses of gonococcal vaccine tried.

(6) Arthritis in general Infective Diseases.

In these cases there is a general infection, with very acute onset, marked constitutional symptons, high temperature, and rapid but not progressive joint involvement. Arthritis, vary--ing widely in duration and severity, may occur in pyaemia, scarlet fever, bacillary dysentery, pneumonia, enteric fever, or secondary syphilis. Enlargement/

Enlargement of the lymphatic glands, in association with the infected joints, almost always occurs, the spleen is commonly enlarged and leucocytosis is present. The larger joints are by preference attacked and in most cases show a definite red blush, with inflammatory oedema of the affected limb, as opposed to the white or bluish colour of the joints in rheu--matoid arthritis. Except in the case of pneumonia and pyaemic infection, the arthritis complicating general diseases is usually transit--ory, and no ultimate disability of joints remain, unless the patient is allowed to go about too soon.

We have given cases to illustrate the type of patient one gets with what we believe to be premonitory symptoms of rheumatoid arth-ritis. These symptoms trouble the patient when run down in health and may clear up com--pletely or may recur after a period of years. We do not flatter ourselves that any type of rheumatoid is going to clear up with a few weeks of treatment as in these cases, for there is the severe type of case that goes on, in our experience, from bad to worse, more joints becoming involved, until the patient becomes a "helpless, pitiful, bed-ridden/

ridden wreck". In any case that comes into our hands where the patient is prepared to get completely cured and will submit to any length of treatment and investigation to attain that desired end, we must have some plan beyond what has been outlined.

Find the Focus.

"Its clinical course and its morbid anatomy stamp rheumatoid arthritis without reasonable doubt as a germ disease of low virulence, but of extreme chronicity and tenaciousness". (Dr. Ralph Stockmann).

"The first thing to bear in mind is that the condition is due to infection and that in about 75% of cases the infective focus is in an easily accessible position, in the teeth or tonsils". (Thomson & Gordon)

"Broadly speaking, we are becoming convinced that rheumatoid arthritis and rheumatic disease, whether in the neighbourhood of joints, muscles, or nerves, is essentially of bacterial origin". (H. Warren Crowe).

The hygiene of the mouth should be attended to as the commonest focus is undoubtedly dental and "if there is no obvious sepsis the teeth should be X-rayed to exclude the presence of apical sepsis". (Billington)

After the teeth the commonest sites of infection are the tonsils and accessory nasal sinuses. The gallbladder, the genito-urinary system, the uterus in the female and the prostate in the male must all be investigated.

The appendix in some cases will be found to be the source of poisoning. Happy the man who finds the definite focus and fortunate the patient who has the disease cleared up in time to prevent further progress.

In February 1923 I saw a patient of 31 years of age who had been admitted to the North Stafford Royal Infirmary with every appearance of crippling rheumatoid arthritis. A general surgeon (Mr. Eric Young) cleared out an appendix which was found to be a bag of pus and Mr. Carter later found a septic nasal sinus. These being cleared up the patient made a striking improvement and when exhibited before the North Staffordshire Medical Society was completely cured.

In November 1926, Dr. Sowry showed, also to the North Staffordshire Medical Society, a patient of 51 who had been admitted to the North Staffs. Royal Infirmary crippled in hands and feet with arthritis that had advanced in spite of treatment. A sample taken from the/

the duodenum showed staphylococcus which was cultivated and a vaccine prepared from it. A course of vaccines, together with dilute H.Cl. as medicine three times a day immediately after food effected a striking improvement and the once crippled patient felt she would like to "dance for joy".

Another type of result is shown in the case of Miss Jardine, aged 45 years, who began to have swollen hands and fingers, with pain in 1910. She would be free for some months and then have an attack of pain with swellings involving more and more of the smaller joints. She was found to have nasal polypi, and had frequent attacks of a troublesome vasomotor rhinitis. This was treated by a Glasgow ear, nose and throat specialist, polypi being removed at half a dozen different times, then a Bournemouth specialist removed polypi and cauterized her nose. She is still subject to attacks of catarrh and her arthritis is not checked by any of the medicines as a conse--quence. The point is that hers is a type of case where the focus is obvious and specialists have done their best to clear it up, but un--successfully.

There is still the type of case where the focus cannot be found, and while the arthritis progresses/

progresses the source of the poison baffles all our inquiries.

Miss Roberts.

A patient of 45 years who nursed her uncle in 1920 with rheumatic fever seven years ago and to this attributes the "rheumatism" which is affecting her now. The metacarpo-phalangeal joints of both hands are swollen and stiffened with ulnar deviation of about one inch. There is creaking of the forearm at supination and pronation. She has severe pains in forearms and hands, especially at night, and feels "stiff all over" in a morning. What worries her most of all is that her knees are beginning to become stiff and painful. She has had all her teeth removed, her health is perfectly good, and there is no source of sepsis to be discovered. She has had courses of radiant heat and sulphur baths at Llandrin--dod Wells and brine baths at Nantwich. She took collosol sulphur and Collosol Iodine, and capsules of Collosol Iodin and Salol, and pluriglandular tablets without even temporary benefit. Finally, Dr. Billington prepared a haemovaccine from her blood and this was given to her without the slightest effect.

Having found and removed the source of infection/

infection and satisfied ourselves there is no poisoning focus present, the problem remaining to be solved is that of detoxicating the system, getting rid of the poison.

Stop the Infection.

"We can assert with some confidence that the microbes of some forms of chronic arthritis and rheumatism have their habitat on or in various mucous membranes and that the commonest site is the alimentary tract". (H. Warren Crowe) Hence if we are driven to try drugs the only drugs that appear to be of any value are such as are reputed to act as intestinal disinfect--ants.

(1) Collosol Sulphur and Collosol Iodine (Crookes)

(2) Tincture of Iodine (French Codex)

(3) Capsules Collosol Iodine with Salol.

(4) "Mist Chlori" of Burney-Yeo.

(5) "Iodicin" (capsules of Calcium-iodo-ricinoleate, gr. 3) B.W. & Co.

(6) "Iodolysin", Allan & Hanbury.

(7) Endocrine preparations, where intestinal atony is present.

I have tried these in many cases and while they have been of undoubted benefit results show that none of them provide us with the ace of trumps.

It/

It is in this stage of the disease that the difficulties of treatment arise and one is anxious to learn what methods are at hand to try to save our patients from pain, crippling and deformity.

Professor Ralph Stockmann and Dr. David Campbell published reports of their work in investigation of "Protein Shock" in "The Glasgow Medical Journal" of February 1925. Professor Stockmann says: "Many years ago, I noticed that after the hypodermic administration of horse serum or of large doses of vaccines there often occurred a marked reaction on the part of the patient - rigor, a high temperature for a few hours, headache, nausea, and vomiting- and that such patients improved greatly, or were cured after repeated administrations. The re--action is now known as "Protein Shock".

Some four years ago my attention was directed to the fact that the intravenous injection of protein bodies is a certain and reliable method of obtaining the protein shock reaction and that dead bacteria such as the bacillus typhosus or bacillus coli afford an accurate means of dosage. The reaction, what ever its action and cause, may be seems to increase the resisting powers of the body to such an extent that the infection is often definitely/

definitely got rid of. I believe the method is capable in most early cases of cutting short the infection, and if its wide use in practice proves this to be so, we shall in the future see little or much less of these dreadful cases of crippling and deformity to which we have been accustomed."

Dr. David Campbell, associated with Prof. Stockmann in the investigation, reports: "Of the 70 cases 12 were not improved in any way. In the 58 in which benefit was derived a striking feature was the diminution of pain and tenderness in the affected joints which frequently followed the reaction." Dr. Camp--bell says: "It can be said at once that in the new specific protein reaction there has been placed in the hands of the physician a weapon which he may justifiably use in the treatment of rheumatoid arthritis with considerable possibility of success."

Injections are given every 4 to 6 days and five injections was the minimum. There is somewhat severe reaction lasting perhaps 24 to 48 hours and it is not easy to carry out the treatment in general practice.

An article by Dr. Billington (Etiology and Treatment of Rheumatoid Arthritis and Allied Diseases) in the B.M.J. of 4th June, 1924, described his method of blood vaccine treatment/

treatment and some of his work I have seen.

Dr. Billington says: "The most reliable anti-bacterial agent is an antogenous vaccine, and if sensitized it can be pushed without producing any reaction or incapacitating the patient in any way. For over four years vaccines made from the blood have been used, either the autohaemo-vaccines, or vaccines made from definite bacteria grown from the blood in ammonium carbonate, citrated glucose broth: from these sources the correct antidote for the causal organisms can more or less be guaranteed.

The anti-bacterial action of the vaccine can be greatly aided by electrical measures, which are used:-

(1) to produce vasodilatation, in order to increase the antibody supply to the affected joint and hasten the absorption of effusion and oedema:
(2) to exert direct antibacterial action: and
(3) to help restoration of function by softening and aiding absorption of adhesions, and stimulating atonic muscles."

In addition to these measures Dr. Billington advocates the use of some of the pluri-glandular preparations.

I have seen cases that have benefitted by this treatment, but two cases I tried with haemovaccines/

haemovaccines were not helped and in my experience the blood vaccine in rheumatoid arthritis is not so effective as I have found it to be in broncho-pneumonia or acute nephritis.

Another interesting method of treatment is that of Dr. Warren Crowe ("Treatment of Chronic Arthritis and Rheumatism"). He says: "As regards rheumatoid arthritis almost over--whelming evidence shows that a certain group of staphylococci described by me in 1912, and one of which I called the Micro-coccus Deformans, is in fact the cause of this disease. I have been able to show that the m. deformans occurs in cases of rheumatoid arthritis. Again the serum of sufferers from rheumatoid arthritis always agglutinates the m. deformans in a greater dilution than does the serum of other people. Lastly pieces of bone removed from cases of rheumatoid arthritis which were being operated on for straightening knee joints grew m. deformans pure culture."

Not only does Dr. Crowe find vaccines his sheet anchor in his Harrogate treatment of Arthritis, but, of great importance to the general practitioner anxious to have a treat--ment ready at hand, he considers that the use of stock vaccines is but little inferior in results.

I obtained from Messrs. Reynolds and Branson/

Branson, of Leeds, the two stock vaccines prepared in Dr. Crowe's laboratory, e.g., Micro-coccus Deformans and Mixed Streptococci. These are given alternately at intervals of 4 or 5 days. There has been no reaction in any of the four cases in which I have used the vaccines and as I only obtained them in January 1927 and the treatment is necessarily prolonged it is as yet too early to speak from my own experience of the value of this treatment.

At present it seems to offer the best and most easily accessible treatment for the early rheumatoids one is so anxious to help.

Mrs. Willshaw, 67, Lord Street, Etruria.

Aged 55 years.

Shows Dupuytrens contracture in little fingers of each hand with contraction of other fingers of rt. hand.

There is also thickening of the metacarpo-phalangeal joints and both wrists are becoming ankylosed.

This is obviously a mixed infection.

Duration - nine years.

3. Deformities dealt with.

Once the infection is stopped the fibrositis, contractures, subluxations and limitations of joint movement may next be dealt with, and this is often a very tedious and difficult business. New fibrous tissue may be dealt with by voluntary movement; massage, baths, and appropriate exercises, anything almost rather than rest.

Deformities of joints have usually to be left as they are. In less severe cases we may have muscular atrophy and contracture which cause flexion, adduction, and limitation in the joints, adhesions and thickening of articular fibrous tissue. Treatment of this must be directed: (1) to restore movement in the joints by elongating the contracted muscles and shortening the elongated ones so that they may each regain normal action: (2) to get rid of the fibros--ities in and around the joints, and to stretch and render more pliable the ligamentous tissues and adhesions: and (3) to bring up the bulk and strength of the muscles. For these as much active movement as is possible through gradually increased passive movements and manipulations, and by hard massage of the fibrous tissues and muscles.

S U M M A R Y.

(1) Rheumatoid Arthritis is a disease in which along with microbic infection there seems to be associated disordered metabolism and disturbed endocrine balance.

(2) Most of its victims are females.

(3) An essential of its treatment is the discovery of a septic focus and in the search for this specialists of the different branches of surgery and medicine may be necessary.

(4) The disease should be recognised in its early stages and the fullest investigation made at once.

(5) Treatment may be prolonged.

(6) The most successful results are likely to come from the use of antogenous vaccines; but improvements almost as good may be expected from the use of stock vaccines of polyvalent staphylococci and streptococci.

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REFERENCE.

Bannatyne:	Rheumatoid Arthritis.
Berkeley:	Endocrine Medicine.
Beaumont & Dodds:	Recent Advances in Medicine.
Bruce:	Sciatica.
British Medical Journal:	21st June 1924.
Cabot:	Differential Diagnosis.
Comrie:	Selected Works of Thomas Sydenham.
Cecil:	Text Book of Medicine.
Crowe:	The Treatment of Chronic Arthritis & Rheumatism.
Duke:	Allergy, Asthma, Hay Fever, etc.
Falta:	Endocrine Diseases.
French:	Index of Differential Diagnosis.
Fuller:	Rheumatism, Rheumatic Gout, & Sciatica.
Garrison:	History of Medicine.
Garrod, A:	A Treatise on Rheumatism.
Glasgow Medical Journal:	February 1925.
Hawthorne:	Rheumatism, Rheumatoid, Arthritis & Subcutaneous Nodules.
do.	Studies in Clinical Medicine.
Jones, A. Bassett & Jones Llewellyn:	Fibrositis.
Jones, R.Llewellyn:	Arthritis Deformans.
Lancet:	Modern Technique in Treatment, Vols 1, 2, & 3.
Maclagan:	Rheumatism.
Ministry of Health:	Report No. 23. "The Incidence of Rheumatic Diseases."

REFERENCE (Contd.)

Osler & Macrae:	The principles & Practice of Medicine.
Parsons, T.R:	Fundamentals of Bio-Chemistry.
Poynton & Paine:	Researches on Rheumatism.
Practitioner:	January 1912. August 1927. Sept., 1927.
Pryde, J:	Recent Advances in Bio-Chemistry.
Stockman, R:	Rheumatism & Arthritis.
Strangeways T.S.P:	Bulletin of the Committee for the Study of Special Diseases. Vols 1,2, 1907.
Thomson & Gordon:	Chronic Rheumatic Diseases.
Weil:	Internal Secretion.
Wilde:	The Physiology of Gout, Rheumatism & Arthritis.
Williams; Leonard:	Middle Age and Old Age. Obesity.
Yeo, Burney:	A Manual of Medical Treatment.

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